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AFR 110-14 REPORT

OFFICE OF THE SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

F-16CG S/N 88-0448
8 NOVEMBER 1993

Captain Dillon L. McFarland
Investigating Officer

NUCLEAR REGULATORY COMMISSION

District No. _____ Official Exh. No. 161
 In the matter of PFS
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 Applicant RECEIVED
 Intervenor _____ REJECTED _____
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 DATE 7/1/02 Witness _____
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PFS Exh. 161

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STATEMENT OF AUTHORITY AND PURPOSE

AUTHORITY: An investigation of the F-16CG(S/N 88-0448) mishap which occurred in Range 61 within the 4806 Restricted Area on November 8, 1993 was conducted at Nellis Air Force Base (AFB), Nevada. Captain Dillon L. McFarland was appointed by the Commander, USAF Weapons and Tactics Center (USAFWTC), to conduct an AFR 110-14 investigation of the accident under authority of USAFWTC/CC letter, dated December 08, 1993 (TAB Y). The investigating officer is assigned to the 422 Test and Evaluation Squadron, 57th Wing, at Nellis AFB, Nevada. The legal advisor was Captain Kirk Foster, assigned to USAFWTC/JA.

PURPOSE: The purpose of this accident investigation was to obtain all available evidence for use in claims, litigation, disciplinary action, adverse administrative proceedings, and for all other purposes in accordance with AFR 110-14.

SUMMARY OF FACTS

- 1. HISTORY OF FLIGHT:** On 8 November 1993, Captain John M. Barelka, the mishap pilot(MP), was flying an F-16CG (S/N 88-0448) as the number three aircraft (call sign: Wolf 3) in a four ship of F-16's on a United States Air Force Weapons School syllabus sortie (TAB A-1). The flight lead for the mission was Captain Michael Fantini (Wolf 1). The instructor pilots in the flight were Captain Eric Overturf (Wolf 2) and Lieutenant Colonel Daniel Conroy (Wolf 4). All mission elements to include planning, briefing, preflight, ground operations, taxi, takeoff, flight to the Nellis range complex, ingress to the target area, and weapons delivery were unremarkable (TAB V-2-8). During the egress portion of the mission, while maneuvering at low altitude, the mishap aircraft impacted the ground at 37-11.10 North Latitude, 115-26.20 West longitude and was destroyed. No ejection was initiated and the mishap pilot was fatally injured (TAB A-1). News media interest was handled by the United States Air Force Weapons and Tactics Center Public Affairs Office (TAB AA-5).
- 2. MISSION:** The mishap pilot was a student at the United States Air Force Weapons School and was flying in a weapons delivery mission that is part of the F-16 syllabus requirements (TAB A-1, AA-16). The flight of four F-16's were to fly a low level navigation route from the eastern portion of the Desert Military Operating Area (MOA) to Restricted Area 4806, Range 64 (TAB AA-1). Once in Range 64 each aircraft was to deliver two MK-82 general purpose (GP) bombs on target 64-8, a simulated POL facility. Upon completion of the weapons delivery profile, the four ship was to egress the target area and fly a return low level navigation route to the eastern portion of the Desert MOA (TAB AA-1). Eight F-15 (Eagle) aircraft were to provide the opposing force (OPFOR) for the mission. Their job was to replicate enemy aircraft protecting the target area. The intelligence scenario also called for the simulation of enemy surface-to-air missile systems (SAMS) and anti-aircraft artillery (AAA) (TAB AA-24).
- 3. BRIEFING AND PREFLIGHT:** All flight members had adequate crew rest for the mission (TAB V-1-9). Captain Barelka arrived in the squadron at approximately 0850 to prepare for the mission (TAB V-4). The mission was thoroughly planned and the profile for this particular flight was similar to the previous three missions Captain Barelka had flown (TAB AA-24). The flight briefing started on time and Captain Michael Fantini, who was the flight lead for the mission, conducted an in-depth briefing of all mission elements (TAB V-2-6). A military flight plan for the mission was filed on a Nellis Air Force Base Form 175 which served as the local flight clearance as well as the daily flight order. (TAB K-1). All prerequisites for the flight had been accomplished prior the pilots departing the squadron for their aircraft (TAB K-1). Aircraft preflight, engine start, power-on checks, and the remainder of the ground operations prior to take off were unremarkable (TAB V-2-8).
- 4. FLIGHT ACTIVITY:** Wolf 1 flight departed Nellis Air Force Base at 1442 Pacific Standard Time (PST) (TAB A-1). The flight to the eastern part of the Desert MOA was approximately fifteen minutes and all required checks were accomplished with no abnormalities (TAB V-2-6). Wolf flight began the ingress portion of the mission at approximately 1457 PST at medium altitude going from east to west toward R4806 and the target area in range 64 (TAB AA-1-2). The 4-ship was together as they descended to low altitude at a predetermined point on their route of flight. Once at low altitude, Wolf flight was opposed by a portion of the opposing force F-15's. The first of two engagements with the F-15's occurred in the Desert MOA just east of the Sally corridor. The second engagement with the F-15's took place just west of the Sally corridor in R4806. There was nothing out of the ordinary about any of the air-to-air engagements with the opposing force F-15 aircraft. As Wolf flight terminated the second engagement they had now became separated into 2-ship elements and were separated by approximately 8-10 nm. Because Wolf 3 and 4 were the furthest to the West, Wolf 1 cleared them into the target area first. Weapons delivery for all four aircraft was unremarkable. As Wolf 1 and 2 came off target, Wolf 4 initiated a wounded bird (simulated aircraft damage) and transmitted to the flight that he had sustained aircraft damage from an enemy SAM and could only fly 320 kts. Each flight member then began executing their responsibilities in accordance with the briefed wounded bird plan. Wolf 3 transmitted that he was in a sawtooth (prebriefed maneuver to stay in close proximity to the wounded bird so as to keep mutual support) to the north. Wolf 1 and 2 caught up to Wolf 3 and 4 and Wolf 1 called that he was visual with Wolf 4 and offsetting to the south. Wolf 1 directed Wolf 3 and 4 to offset to the north. Shortly after, Wolf 3 called that he was spiked (enemy radar indications) and notching (defensively reacting to a possible enemy radar missile shot) to the north (TAB V-2-6).

5. **IMPACT:** At approximately 1517 PST on 8 November 1993, the mishap aircraft impacted the ground 17 miles SW of Alamo, Nevada (TAB A-1). The aircraft was totally destroyed upon impact. Engineering analysis of the wreckage revealed that the aircraft engine, flight instruments, and flight controls were all responding normally immediately prior to the impact (TAB J-16-22).

6. **EJECTION SEAT:** Investigation revealed that no ejection attempt was initiated (TAB J-26).

7. **PERSONAL AND SURVIVAL EQUIPMENT:** All personal and survival equipment inspections were current and documented in accordance with appropriate technical orders (TAB U-15).

8/9. **RESCUE/CRASH RESPONSE:** Rescue and crash response was adequate. Wolf 4 notified GCI of a possible downed aircraft at 1518 PST. Five minutes later at 1523 PST it was confirmed that Wolf 3 was down in range 61. All of the appropriate information was passed to Blackjack and they requested helicopter support from the Department of Energy (DOE) and from the 66 RQS. The DOE helicopter (Air Rescue 01) was the first on the scene at 1551 PST. At 1752 PST, the 66 RQS helicopter (Jolly 10) from Nellis AFB arrived at the site. The site was secured at that time (TAB AA-5).

10. **MAINTENANCE DOCUMENTATION:** A review of all maintenance forms was accomplished and there were no discrepancies or any unaccomplished Time Compliance Technical Orders related to the mishap (TAB H-1-2).

11. **MAINTENANCE PERSONNEL AND SUPERVISION:** A review of preflight servicing indicated that all servicing was accomplished and documented (TAB U-1). All maintenance supervisors and their personnel were found to be qualified and not related to the mishap.

12. **ENGINE, FUEL, HYDRAULIC, AND OIL INSPECTION ANALYSIS:** All analysis were accomplished and found unremarkable and not related to the mishap (TAB J-1-10).

13. **AIRFRAME AND AIRCRAFT SYSTEMS:** The airframe and aircraft systems were determined to be operating normally at the time of the mishap (TAB J-12-21).

14. **OPERATIONS PERSONNEL AND SUPERVISION:** The mission was conducted under the authority of Nellis AFB Form 175, Daily Flight Order signed by Major Robin Rand, Weapons School F-16 Operations Officer (TAB K-1). The mission briefing was conducted in accordance with Air Force regulations and local directives by Captain Michael Fantini. The F-16 Division Commander, Lieutenant Colonel Daniel Conroy was present at the briefing (TAB V-2-6).

15. **PILOT QUALIFICATIONS:** A review of the mishap pilots flight records indicate that he was qualified and authorized to fly the mission. Captain Barelka was an experienced pilot with over 1,800 hours of flying time and over 800 hours of F-16 time (TAB G-1). The other three members of the flight were also qualified and authorized to fly the mission:

Captain Fantini (Wolf 1) is an experienced fighter pilot with approximately 1100 hours of flying time in the F-16 (TAB V-4).

Captain Overturf (Wolf 2) is an experienced fighter pilot with over 1900 hours of flying time in the F-16 (TAB V-6).

Lieutenant Colonel Conroy (Wolf 4) is an experienced fighter pilot with approximately 2000 hours of flying time in the F-16 (TAB V-2).

16. **MEDICAL:** Captain Barelka was medically qualified for flying duties at the time of the mishap (TAB T-1, V-9). In addition, toxicology and alcohol laboratory studies were done by the Armed Forces Institute of Pathology and found to be non-contributory to the accident (TAB X-1).

17. **NAVIGATIONAL AIDS AND FACILITIES:** No Notice to Airmen bulletins were issued for the local flying area which would have affected the mission (TAB AA-3).

18. WEATHER: The weather on the Nellis AFB range complex at the time of the mishap was non-contributory to the mishap. Skies were clear and the visibility was in excess of seven miles. The winds were out of the south-southwest at less than 10 knots (TAB W-1, V-2).

19. DIRECTIVES AND PUBLICATIONS:

a. Directives and publications applicable to the operation of the mission were:

1. AFR 60-1 Flight Management
2. AFR 60-16 Flight Rules
3. AFR 50-46, Nellis AFB Supplement 1, Weapons Ranges
4. ACC/MCR 51-50 Fighter Air crew Training
5. MCR 55-116 F-16 Pilot Operating Procedures
6. ACCR 55-79 Air crew/Weapons Controller Procedures for Air Operations
7. Nellis AFB Regulation 55-1 Local Operating Procedures
8. 57 WG In-Flight Guide
9. TO 1F-16C-1 F-16 Flight Manual
10. TO 1F-16C-1CL-1 Pilots Abbreviated Flight Crew Checklist
11. MCM 3-1 (S) Mission Employment Tactics: Tactical Employment
12. TO 1F-16C-6 Scheduled Inspection and Maintenance Requirements
13. TO 1F-16C-6WC-1 Preflight/Post flight Inspection Work cards
14. TO 1F-16C-6WC-2 Phase Inspection Work cards
15. TO 1F-16C-2-12JG-00-1 Servicing
16. TO 1F-16C-2-10JG-00-1 Aircraft Safety
17. TO 1F-16C-2-09JG-00-1 Towing and Taxiing
18. TO 1F-16C-2-00JG-00-1 Job Guide Index
19. 57 WG FCIF
20. ACC Phase Manual-Course No. F16001DOPN

b. There were no known or suspected violations from the directives and publications by crew members or others involved in the mission.

20. STATEMENT OF OPINION (NOTE: UNDER 10 U.S.C. 2254 (D), ANY OPINION OF THE ACCIDENT INVESTIGATOR AS TO THE CAUSE OF, OR THE FACTORS CONTRIBUTING TO, THE ACCIDENT SET FORTH IN THE ACCIDENT INVESTIGATION REPORT MAY NOT BE CONSIDERED AS EVIDENCE IN ANY CIVIL OR CRIMINAL PROCEEDING ARISING FROM AN AIRCRAFT ACCIDENT, NOR MAY SUCH INFORMATION BE CONSIDERED AN ADMISSION OF LIABILITY BY THE UNITED STATES OR BY ANY PERSON REFERRED TO IN THOSE CONCLUSIONS OR STATEMENTS):

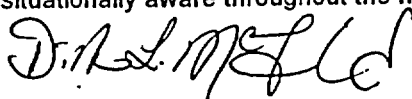
The cause of this aircraft accident was Captain Barelka's misprioritizing his tasks for a very short period of time while maneuvering at low altitude. This allowed his aircraft to get into a non-recoverable situation.

The crash survivable flight data recorder (CSFDR) provided very specific data as to the aircraft parameters during its last thirty seconds of flight. The data shows that Captain Barelka made a left turn to the north that coincides with the radio call that he made indicating that he was defensively reacting to the north. That was approximately 25 seconds prior to the impact. Shortly after that, Captain Barelka initiated a right turn using approximately 85 degrees of bank and 5g's. He was approximately 450 feet above ground level at that time and was 8 seconds from impact. During the next 5 seconds, the aircraft transitioned to a 15 degree nose low attitude, still turning to the right, with a vertical velocity in excess of -150 ft/sec. The nose low attitude was the result of the aircraft being overbanked to 97 degrees while still maintaining 4-5g's. Indications are that just prior to impact the aircraft was responding to inputs from the pilot that were indicative of the fact that Captain Barelka had recognized that he needed to recover the jet. However, the altitude remaining at that point was less than the altitude required to avoid impact with the ground.

Although I have over 1800 hours of flying time myself, it is difficult as a fellow aviator and F-16 fighter pilot to speculate on what another pilot is or was doing in his cockpit at any given time. However, based upon the facts gathered by this investigation, I believe the following probably occurred:

Instead of monitoring the nose of his aircraft in relation to the horizon, Captain Barelka had focused his attention somewhere else long enough to allow the incideous drop in the aircraft pitch attitude. He may have been looking over his right shoulder, either for his wingman or the perceived adversary aircraft. He may have been looking inside the cockpit. The radio call that he made just prior to the impact would support that assumption because in order to transmit his position relative to the known steerpoint he would have had to look at the horizontal situation indicator(HSI) located in the middle of the cockpit. Captain Barelka may have been the victim of the G-excess illusion, or G-excess effect. By reading the two articles in TAB O, one can see that the circumstances surrounding Captain Barelka's mishap were very similar to those discussed.

Finally, there were no indications of any flight, mechanical, or personal abnormalities. Nor was there any indication that Captain Barelka was uncomfortable with the mission or was becoming task saturated. He seemed to be situationally aware throughout the mission and was a good pilot and aviator.

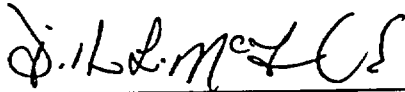


DILLON L. MCFARLAND, Capt, USAF
Aircraft Accident Investigation Officer

MEMORANDUM FOR RECORD

The following pages of this report are not original for the reasons given:

<u>PAGE</u>	<u>REASON</u>
A-1	Size of Original
C-1	Size of Original
D-1	Size of Original
All Pages, Tab G	Retained by Originating Agency
All Pages, Tab J	Originals not available
All Pages, Tab K	Size of Original
All Pages, Tab L	Size of Original
All Pages, Tab M	Size of Original
Q-1	Included in AFR 127-4 Report
All Pages, Tab R	Size of Original
All Pages, Tab T	Retained by Originating Agency
U-14, U-15	Size of Original
W-2 through W-6	Size of Original
AA-2 through AA-15	Retained by Originating Agency



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